

System for Analyzing Microscopic Defects and Defect Propagation Due to Aging, Phase I

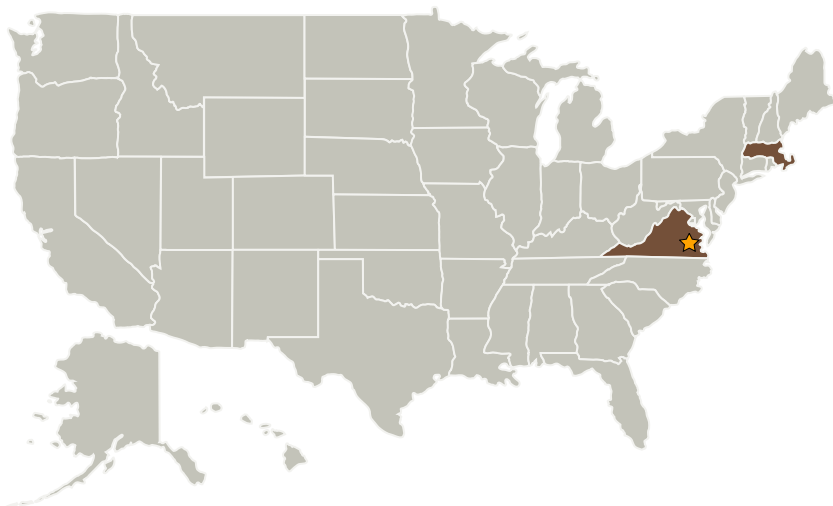
Completed Technology Project (2007 - 2007)



Project Introduction

New technology is needed for sensing and characterizing incipient defects, and assessing the effects of aging in aerospace components. Next generation materials, including nickel-based superalloys that are exceedingly difficult to inspect with existing technology are being adopted by designers and manufacturers. The ability to ascertain the remaining life of a spacecraft component, and develop mitigation procedures to improve safety and reliability, are critical. RMD proposes a revolutionary new imaging technology based on microscopic, solid-state sensors, magnetic imaging and "eddy current mapping". The new nondestructive evaluation (NDE) technology will be used to detect, map and characterize nano-scale cracks and corrosion in superalloys and metallic components. The data will be used to develop an accurate model for the prediction of defect propagation resulting from aging. The NDE technology will improve spacecraft integrity and safety, reduce the cost and complexity of inspection, and characterize incipient defects and defect propagation. It can be used during materials selection and testing and for evaluating components in the field as they age. The technology taxonomy areas addressed by this proposal include: avionics and astronics, information, materials, sensors and sources, structures, and verification and validation.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Radiation Monitoring Devices, Inc.	Supporting Organization	Industry	Watertown, Massachusetts

Primary U.S. Work Locations

Massachusetts	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.5 Nondestructive Evaluation and Sensors